



NORTHERN HARDWOOD NOTES

A Case History Of All-age Management

Single-tree selection "works" in sugar maple stands in the Lake States. This system of all-age management has been used for 31 years on the Argonne Experimental Forest. In 1953, researchers found that cutting according to basal area guides is both a convenient and effective way to regulate a stand. Later experience showed that achieving good stand structure could be speeded by using a separate basal area guide for each of three sawtimber size classes, instead of lumping them into one sawtimber class.

Regulating an even-aged stand consists of gradually reducing the basal area of the pole-and small saw log-size trees, while increasing the basal area of the medium and large saw log-size trees, until the desired balance is reached.

By cutting to specified basal areas every 10 years in the four diameter size-classes, managers can easily regulate second-growth sugar maple stands. The following table shows how regulation in the Argonne Forest stand progressed between 1947 and 1978 after 3 cuttings. Note the rapid change between 1973 and 1978. (Basis: seven ~~1/5~~ acre plots).

	Diameter classes (inches)				Total
	5-9	10-14	15-19	20-24	
	----- Sq ft -----				
1947 Initial stand	30	38	14	0	82
After 1st cut	27	33	13	0	73
1962-63 After 2nd cut	17	27	26	5	76
1973 After 3rd cut	15	26	31	9	82
1978 Stand	15	27	32	18	93
Basal area goal	16	22	26	20	84

By regulating a stand, managers assure that growth is well distributed. When the basal areas in the foregoing table are converted to volumes by local tables, you can see that the stand is developing favorably.

	Diameter class (inches)			Total
	10-14	15-19	20-24	
	----- Bd ft -----			
Board foot goal	1,709	3,314	3,150	8,173
1978 stand volume	2,210	4,075	2,785	9,070

The 1978 stand volume exceeds the goals in all but the large saw log category. By the fall of 1983, at the 4th cut, the stand was fully regulated for both board foot and basal area goals. Most of the area will have growth exceeding 350 board feet per acre per year.

Regulation will pay off in quality. Every bit of growth will be salable; in the last harvest only 77 percent was removed for sale because the 20-to 24-inch trees had not yet reached volume goal for their age class.

Quality is on the rise in other ways, too. Merchantable heights are increasing as developing trees overtop trees that "crowned out" earlier. Also, sugar maple is slowly making up more and more of the stand.

Could development have been more rapid? Yes, if present basal area guides had been applied in the first two cuts, which were heavier than currently recommended. Drought also reduced growth rates by nearly half from 1974 to 1977.

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